Claims

What is claimed is:

Sub B1

1. A composition comprising:

a polypeptide; and

an active agent covalently attached to said polypeptide.

2. The composition of claim 1 wherein said active agent is selected from the group consisting of the compounds listed in TABLE 1.

3. The composition of claim 1 wherein said polypeptide is a homopolymer of a naturally occurring amino acid.

4. The composition of claim 1 wherein said polypeptide is a heteropolymer of two or more naturally occurring amino acids.

5. The composition of claim 1 wherein said polypeptide is a homopolymer of a synthetic amino acid.

6. The composition of claim 1 wherein said polypeptide is a heteropolymer of two or more synthetic amino acids.

7. The composition of claim 1 wherein said polypeptide is a heteropolymer of one or more naturally occurring amino acids and one or more synthetic amino acids.

8. The composition of claim 1 wherein said active agent is covalently attached to a side chain, the N-terminus or the C-terminus of said polypeptide.

9. The composition of claim 1 wherein said active agent is a carboxylic acid and wherein said active agent is covalently attached to the N-terminus of said polypeptide.

10. The composition of claim 1 wherein said active agent is an amine and wherein said active agent is covalently attached to the C-terminus of said polypeptide.

11. The composition of claim 1 wherein said active agent is an alcohol and wherein said active agent is covalently attached to the C-terminus of said polypeptide.

12. The composition of claim 1 wherein said active agent is an alcohol and wherein said active agent is covalently attached to the N-terminus of said polypeptide.

13. The composition of claim 1 further comprising a microencapsulating agent.

14. The composition of claim 13 wherein said microencapsulating agent is selected from the group consisting of polyethylene glycol (PEG), an amino acid, a sugar and a salt.

15. The composition of claim 1 further comprising an adjuvant.

16. The composition of claim 15 wherein said adjuvant activates an intestinal transporter.

17. The composition of claim 1 further comprising a pharmaceutically acceptable excipient.

18. The composition of claim 1 wherein said active agent is a nutrient and said composition is a nutraceutical composition.

19. The composition of claim 1 wherein said active agent is a pharmaceutical agent and said composition is a pharmaceutical composition.

20. The composition of claim 1 wherein said composition is in the form of an ingestable tablet.

21. The composition of claim 1 wherein said composition is in the form of an intravenous preparation.

22. The composition of claim 1 wherein said composition is in the form of an oral suspension.

23. The composition of claim 1 wherein said active agent is conformationally protected by folding of said polypeptide about said active agent.

24. The composition of claim 1 wherein said polypeptide is capable of releasing said active agent from said composition in a pH-dependent manner.

25. A method for protecting an active agent from degradation comprising covalently attaching said active agent to a polypeptide.

26. A method for controlling release of an active agent from a composition wherein said composition comprises a polypeptide, said method comprising covalently attaching said active agent to said polypeptide.

27. A method for delivering an active agent to a patient comprising administering to said patient a composition comprising:

a polypeptide; and

an active agent covalently attached to said polypeptide.

28. The method of claim 27 wherein said active agent is released from said composition by an enzyme-catalyzed release.

29. The method of claim 28 wherein said active agent is released in a time-dependent manner based on the pharmacokinetics of said enzyme-catalyzed release.

30. The method of claim 27 wherein said composition further comprises a microencapsulating agent and wherein said active agent is released from said composition by dissolution of said microencapsulating agent.

31. The method of claim 27 wherein said active agent is released from said composition by a pH-dependent unfolding of said polypeptide.

32. The method of claim 27 wherein said active agent is released from said composition in a sustained release.

33. The method of claim 27 wherein said composition further comprises an adjuvant covalently attached to said polypeptide and wherein release of said adjuvant from said composition is controlled by said polypeptide.

Sub B6 34. A method for preparing a composition comprising a polypeptide and an active agent covalently attached to said polypeptide, said method comprising the steps of:

(a) attaching the active agent to a side chain of an amino acid to form an active agent/amino acid complex;

(b) forming an active agent/amino acid complex N-carboxyanhydride (NCA) from said active agent/amino acid complex; and

(c) polymerizing said active agent/amino acid complex N-carboxyanhydride (NCA).

35. The method of claim 34 wherein the active agent is a pharmaceutical agent or an adjuvant.

36. The method of claim 34 wherein steps (a) and (b) are repeated prior to step (c) with a second active agent.

37. The method of claim 35 wherein said active agent and said second active agent are copolymerized in step (c).

38. The method of claim 34 wherein said amino acid is glutamic acid and wherein said active agent is released from said glutamic acid as a dimer upon a hydrolysis of the polypeptide and wherein said active agent is released from said glutamic acid by coincident intramolecular transamination.

39. The method of claim 38 wherein said glutamic acid is replaced by an amino acid selected from the group consisting of aspartic acid, arginine, asparagine, cysteine, lysine, threonine, and serine, and wherein said active agent is attached to the side chain of the amino acid to form an amide, a thioester, an ester, an ether, a urethane, a carbonate, an anhydride or a carbamate.

40. The method of claim 38 wherein said glutamic acid is replaced by a synthetic amino acid with a pendant group comprising an amine, an alcohol, a sulfhydryl, an amide, a urea, or an acid functionality.